

FIG.1

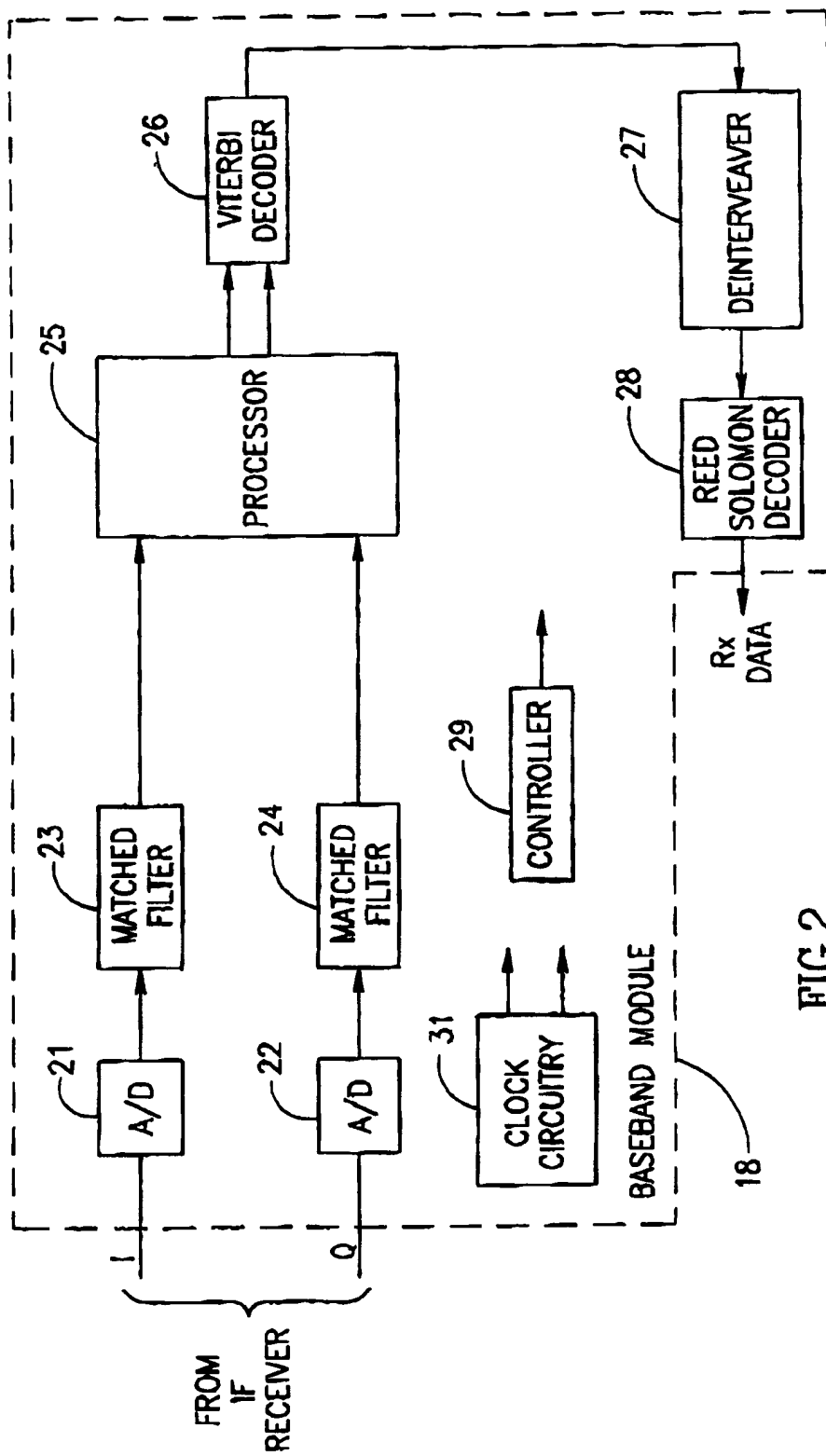


FIG.2

VARIABLE RATE
MODEM MAIN LOOP

POWER UP

ACTIVITY DETECTION

ACQUISITION

PRE-TRACK

TRACKING

FIG.3

ACTIVITY
DETECTION

INITIAL AGC

SIGNAL DECIMATION

SIGNAL DETECT AND
FREQUENCY ACQUISITION

NO

ACTIVITY
DETECTED ?

YES

END

FIG.4

```

graph TD
    Start([INITIAL AGC]) --> 50[COLLECT N SAMPLES]
    50 --> 51[CALCULATE EMS]
    51 --> 52["IG0 = 256 x EMS"]
    52 --> 54["DETERMINE G0 USING  
LOOKUP TABLE"]
    54 --> 56[WRITE CONTROL WORD  
TO HARDWARE]
    56 --> 58[SIGNAL DETECTION]
    58 --> End([END])

```

FIG.5

00584746 000100 00T050" 97278560

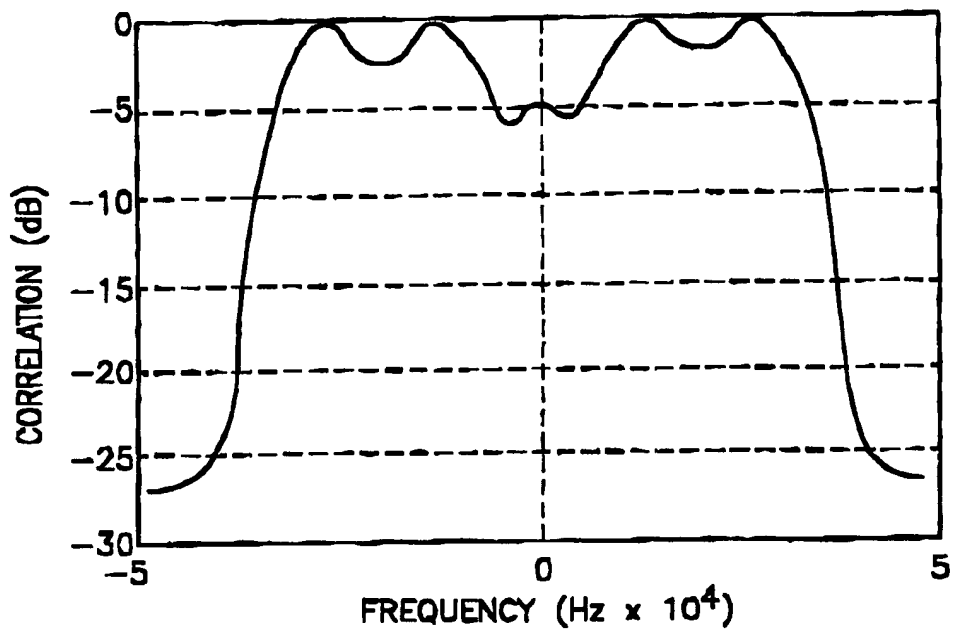


FIG. 6

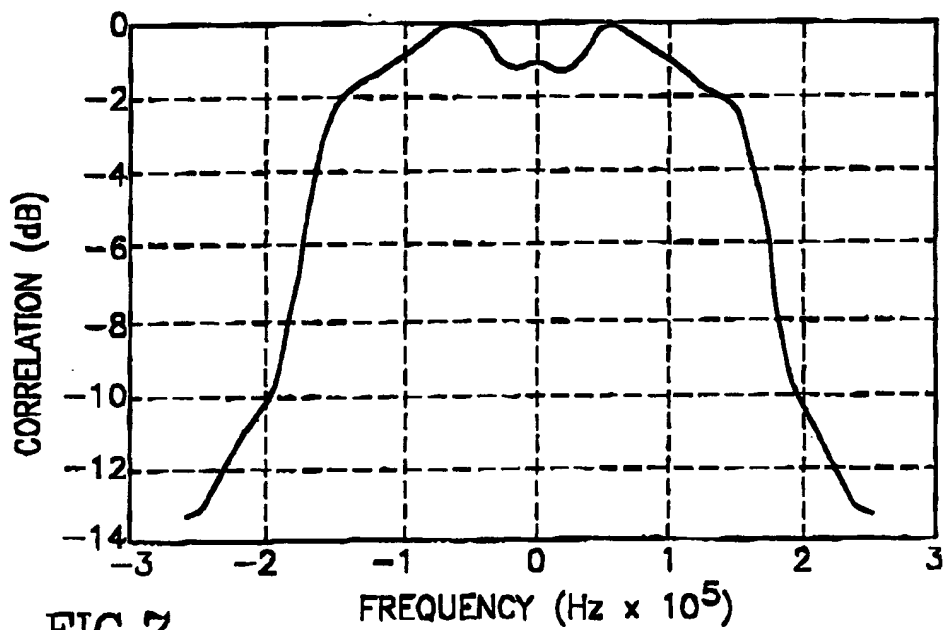


FIG. 7

SIGNAL DETECT AND FREQUENCY ACQUISITION

**CALCULATE SPECTRUM
OF RECEIVED SIGNAL**

SIGNAL PRESENCE DETERMINATION

NC

SIGNAL DETECTED ?

YES

PERFORM CORRELATION

PEAK DETERMINATION

SYMBOL RATE CALCULATION

YES

LIST OF PEAKS
EXHAUSTED ?

LNC

SELECT PEAK CLOSET TO CENTER

FREQUENCY ACQUISITION

ATTEMPT COMMUNICATION

80

SUCCESSFUL ?

NO

YES

END

82

DELETE PEAK
FROM LIST

FIG. 8

```
graph TD; A([ACQUISITION]) --> B[MATCHED FILTER 90]; B --> C[FIRST AGC ACQUISITION 92]; C --> D[TIMING ACQUISITION 94]; D --> E[MATCHED FILTER 96]; E --> F[SECOND AGC ACQUISITION 98]; F --> G[FINE FREQUENCY ESTIMATION 100]; G --> H[PHASE ACQUISITION 102]; H --> I([END]);
```

The flowchart illustrates the acquisition process for a spread spectrum receiver. It begins with an oval labeled "ACQUISITION". This leads to a rectangular block labeled "MATCHED FILTER" with reference numeral 90. The process continues to a rectangular block labeled "FIRST AGC ACQUISITION" with reference numeral 92. This is followed by a rectangular block labeled "TIMING ACQUISITION" with reference numeral 94. The next step is a rectangular block labeled "MATCHED FILTER" with reference numeral 96. This is followed by a rectangular block labeled "SECOND AGC ACQUISITION" with reference numeral 98. The process then moves to a rectangular block labeled "FINE FREQUENCY ESTIMATION" with reference numeral 100. This is followed by a rectangular block labeled "PHASE ACQUISITION" with reference numeral 102. Finally, the process ends at an oval labeled "END".

FIG.9

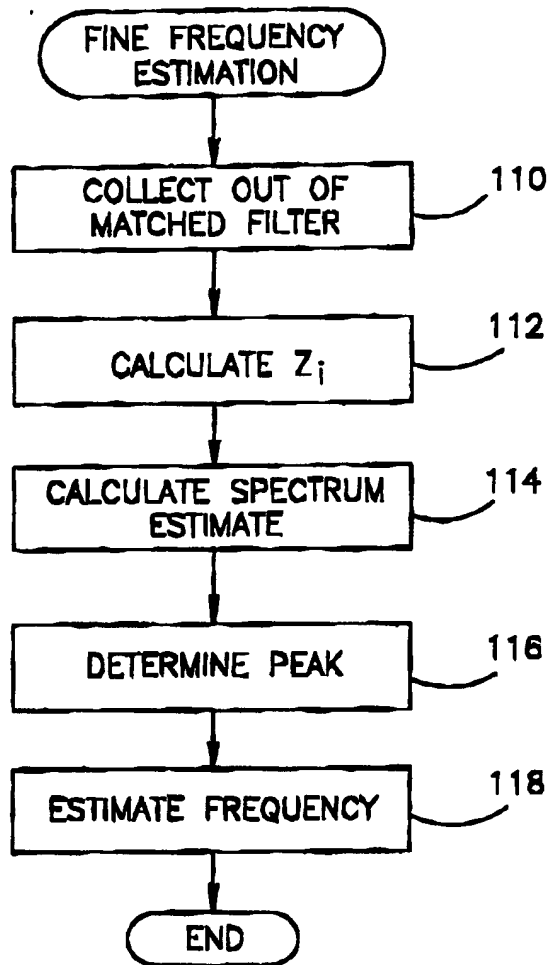


FIG.10

09584746 060100

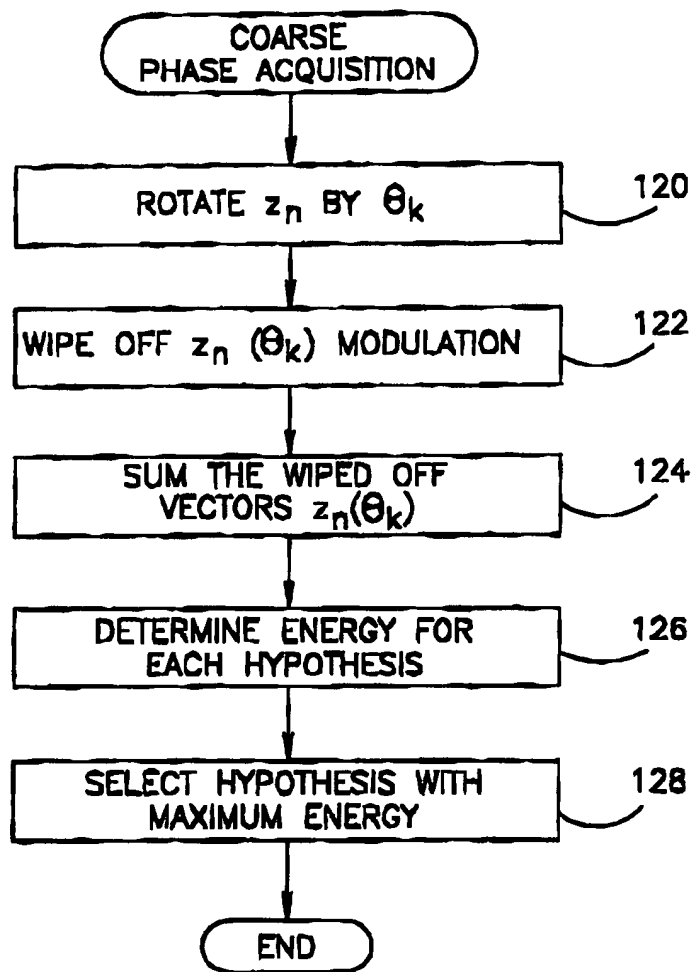


FIG.11

FINE PHASE
ACQUISITION

LET $S(\theta_k) = X + jY$ BE
THE VECTOR WITH
MAXIMAL ENERGY

130

132 $Y > X ?$

YES

SWAP
X AND Y

134

SET SWAP
FLAG

136

CALCULATE $\nu = \frac{Y}{X}$

137

CALCULATE ν

138

139 SWAP FLAG SET ?

YES

$\alpha = 90^\circ - \alpha$

140

NO

CALCULATE ROTATION
ANGLE θ

142

END

FIG.12

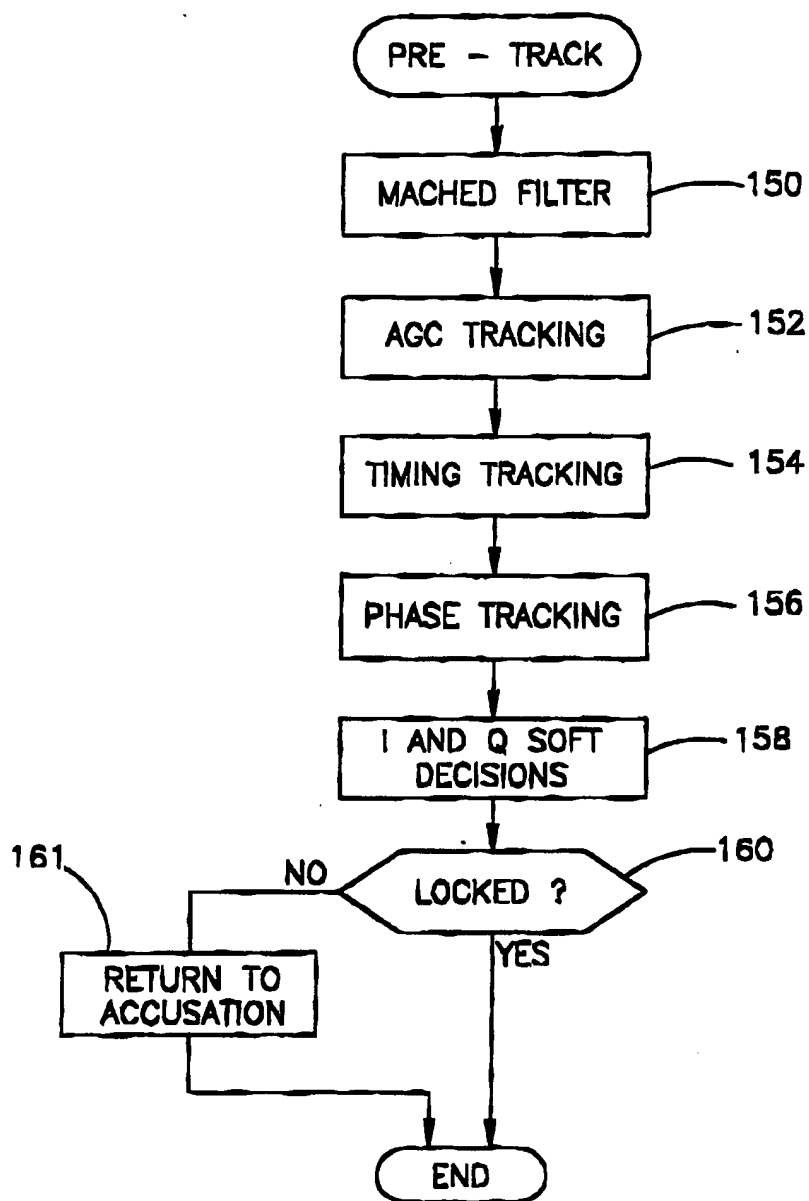


FIG.14

```

graph TD
    Start([AGC TRACKING]) --> Init[INITIALIZE 180]
    Init --> Count8{COUNT = 8 ? 182}
    Count8 -- YES --> Count0[COUNT = 0  
CALCULATE EMS 184]
    Count8 -- NO --> GetOutput[GET MATCHED  
FILTER OUTPUT 186]
    Count0 --> EmS{EMS > 0.25 ? 188}
    EmS -- YES --> ThresholdInc[THRESHOLD =  
1.125 * THRESHOLD 192]
    EmS -- NO --> ThresholdDec{THRESHOLD > 1/256  
AND  
EMS < 0.24 ? 190}
    ThresholdDec -- YES --> ThresholdDecInc[THRESHOLD =  
0.968 * THRESHOLD 194]
    ThresholdDec -- NO --> ?{?}
    ThresholdInc --> CalcGn[CALCULATE Gn 196]
    ThresholdDecInc --> CalcGn
    GetOutput --> CalcGn
    CalcGn --> CalcAGC[CALCULATE AGC  
VALUE 198]
    CalcAGC --> CalcYn[CALCULATE Yn 200]
    CalcYn --> CountInc[COUNT =  
COUNT + 1 202]
    CountInc --> Count8

```

FIG.15

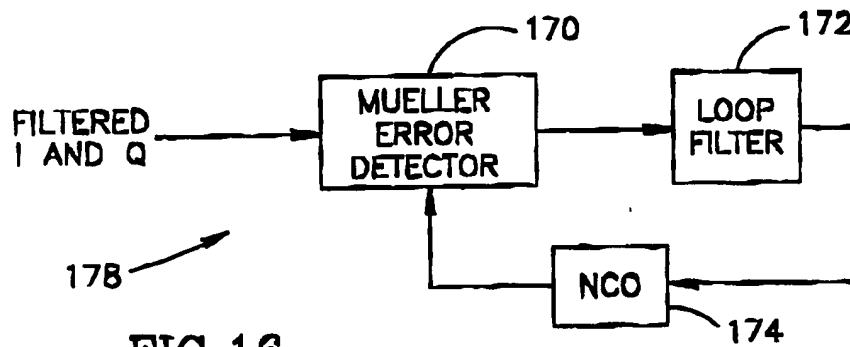


FIG. 16

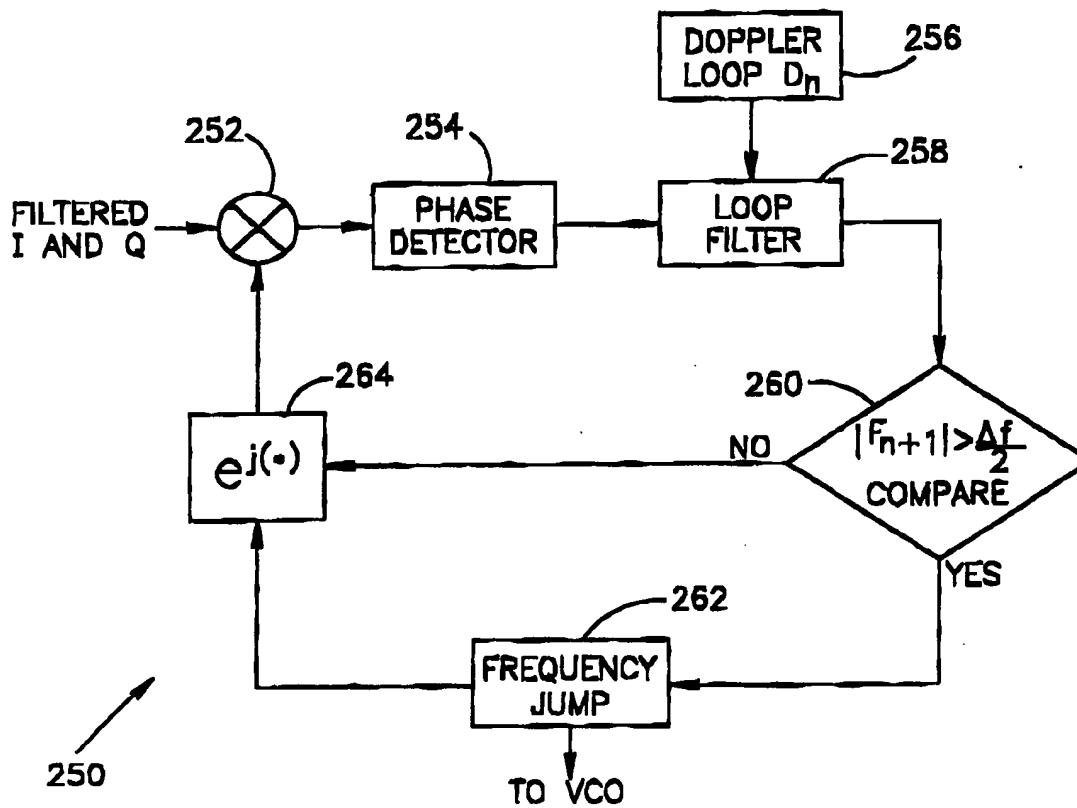


FIG. 17

001090 " 972450

```

graph TD
    TRACKING([TRACKING]) --> 220[MACHED FILTER]
    220 --> 222[AGC TRACKING]
    222 --> 224[TIMING TRACKING]
    224 --> 226[PHASE TRACKING]
    226 --> 228[I AND Q SOFT DECISIONS]
    228 --> 230{LOCKED ?}
    230 -- YES --> TRACKING
    230 -- NO --> 232[SIGNAL DETECTION]
    232 --> END([END])

```

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